Council for Geoscience

DESKTOP DATABASE COMPILATION OF SACS UNIT INFORMATION

Version 2.0

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Introduction

This report provides an overview of a desktop version of a database compilation of information for stratigraphic units accepted by the South African Commission for Stratigraphy (SACS) (Joubert and Johnson, 1998).

The desktop system documented here comprises a graphical user interface to an underlying database comprising various Paradox™ tables. The contents of these data tables are downloads from the Council for Geoscience's corporate database, GEODE, as documented elsewhere (Eglington, 2001).

Acknowledgements for use of this database should refer to the "SACS database compilation prepared by the Council for Geoscience, Pretoria; as documented by Eglington *et al.* (2001)". This open-file report should be referenced as:

Eglington,B.M., Tucker,S., Wolmarans,L.G. and Johnson,M.R. (2001). Desktop database compilation of SACS unit information: Version 2.0. *Council for Geoscience Open File Report,* **2001-0027-O**, 1-22.

Software and computer requirements

This software has been designed to run in a 32-bit Microsoft™ Windows environment i.e. Windows 95/98/NT/ME.

All data tables are Paradox™ and a legal version of the database engine providing access to these tables is installed with the software. Changes to the location of the folder within which the data tables reside may be specified using the BDEAdmin executable file installed with this package. The database engine should be correctly configured if this is the first installation but earlier installations by other software may require that some modifications to the setup be made manually. **Appendix A: Configuring the Borland Database Engine (BDE)** documents the configuration expected by this software.

Printed report generation is achieved using the RAVE system of Nevrona Designs™. All necessary files for this purpose are also supplied with the package. A .INI file (in the \Windows folder) specifies the locality in which the report specifications are stored.

The screen view presented to the user is best viewed at a desktop setting of 800 x 600 but the various windows will resize automatically to cater for different screen resolutions and sizes.

Installing the software

The package, as supplied, may be installed following standard 32-bit Windows[TM] procedures. These are achieved by an Installshield[TM] installation routine which handles the correct placement of all files and their registration with the operating system. It is recommended that previous versions of this database first be uninstalled so as to ensure that older versions are removed from the computer.

This SACS database software is freeware and the package, as a whole, may be freely disseminated to other users within the limitations described by the LICENSE.TXT and README.TEXT files supplied with the software. It should be noted that the contents of the database remains the property of the Council for Geoscience and may not be used for any purpose other than that provided by this software package.

Using the software

Querying the database

The graphical user interface (GUI) provided allows users to get information for specific units, as illustrated in Figure 1. The only country for which information is currently available is South Africa but future implementations which include information for other countries is being catered for. Users may type the first few letters of a unit's name into the field labelled **Find** and the software will find the nearest match to the characters specified. The locate routine used is not case sensitive. Alternatively, one may step through the database by clicking on the navigator buttons just above the cyan-coloured boxes (Figure 1).

In all cases, the current unit's name and rank are shown in the cyan boxes. Below this are edit boxes detailing the unique code assigned to the unit by SACS; the abbreviation used for this unit on Council for Geoscience maps and the estimated minimum and maximum age of the unit. To the right, fields specify the erathem to which the unit belongs; whether the unit name has been formally approved by SACS and the name of the unit one level higher in the stratigraphic hierarchy. In cases where no higher levels apply, the statement "no higher level" is shown.

The date on which the contents of this desktop database were extracted from the corporate database is provided in the status bar at the bottom of the primary window. Subsequent updates will be available from the Council for Geoscience web site: www.geoscience.org.za

Screen text output from the database

Lower down the page are a number of tabsheets. The default view provided when the software is first run has lists of units in two grids, one at the lower left of the window and the other at the lower right (Figure 1).
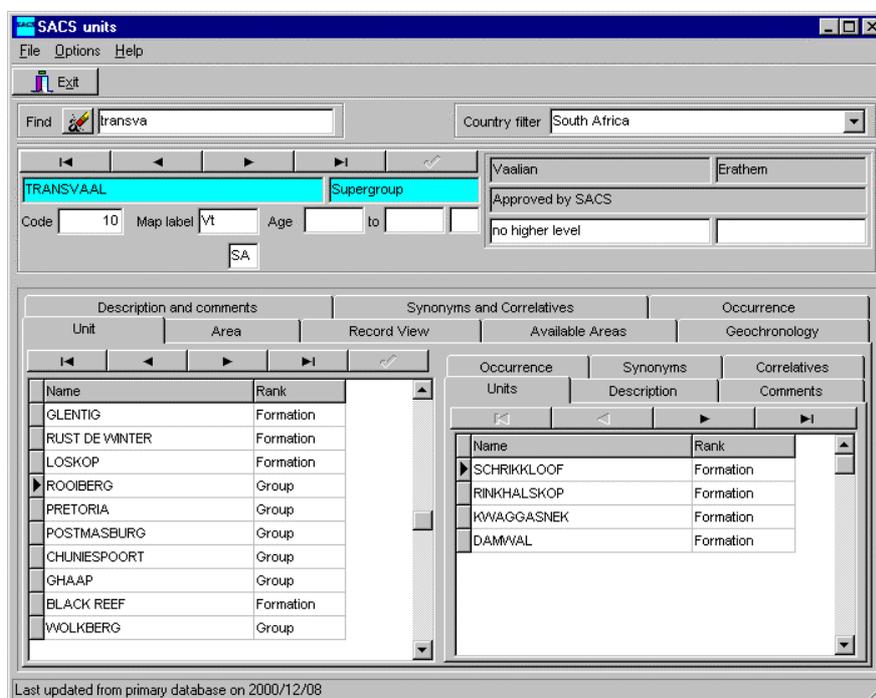
Figure 1. Default view of the stratigraphic database. Specific units may be located by typing in the first few letters of its name. Sub-units and sub-sub-units are illustrated in the two grids at the bottom of the window. Additional information relevant to the unit selected is also provide on several tabsheets.

The leftmost of these two grids provides a list of sub-units for the unit specified in the cyan boxes. One may step through this list using the navigator buttons just above the list. In cases where hierarchically lower level units are defined for the current sub-unit selected (as shown by right-pointing arrow/triangle), these units are listed in the rightmost grid. The user may elect to make any one of the sub-units the current selected unit i.e. to list it in the cyan-coloured boxes by double clicking on the unit in the appropriate grid. It is also possible to navigate up the hierarchy by double-clicking on the box listing the parent unit.

Descriptive information on the principle unit selected is provided on the tabsheet labelled **Description and Comments**, as illustrated in Figure 2 whilst synonyms which have appeared in the literature or on maps are provided on the tabsheet labelled **Synonyms and Correlatives** (Figure 3). In cases where the SACS unit selected is correlated with other formally recognised units, either in South Africa or in other countries, these may also be shown in the list on this tabsheet (Figure 3).
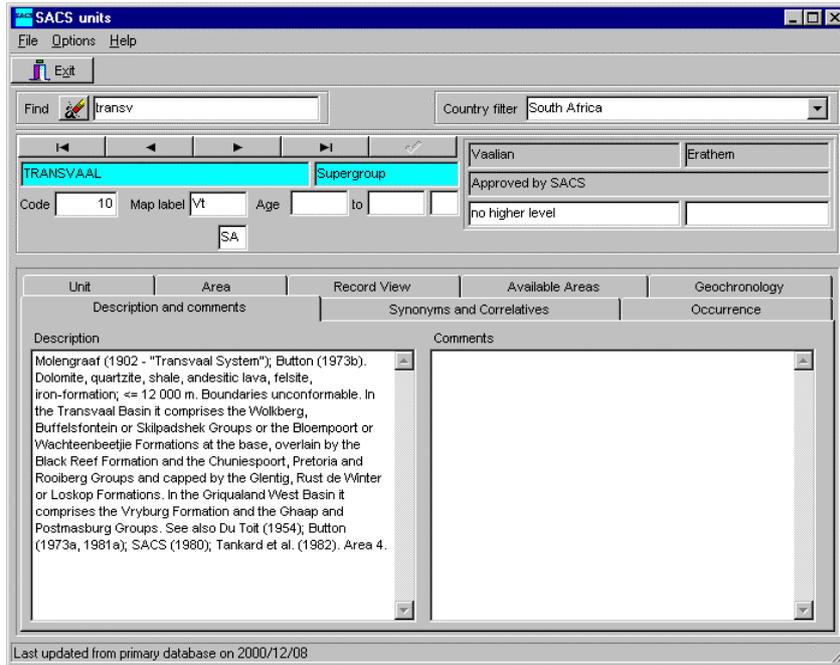
Figure 2. Description of the principle unit selected and additional comments, if applicable.
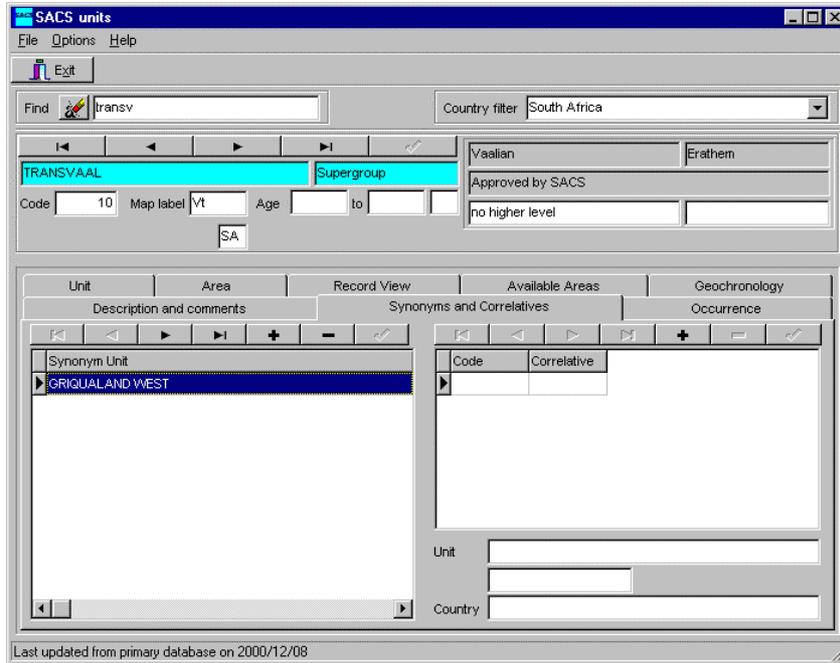
Figure 3. List of synonyms (previously used names) and correlated units for the principle unit selected. Synonyms may have been used in the literature or on maps whilst correlatives may occur in South Africa or in other countries.

The tabsheet labelled **Occurrence** provides a list of geographic or geologically defined areas in which the principle unit occurs. These areas include those defined in the SACS publication: Abridged lexicon of South African stratigraphy (Joubert and Johnson, 1998).

Users may elect to distinguish between sub-units occurring in different geographic areas, as illustrated in Figure 4. Here, separate lists of sub-units are presented for the Transvaal Supergroup as it occurs in the Western Kaapvaal Craton and in the Central Kaapvaal Craton. Available areas are those listed on the **Available Areas** tabsheet
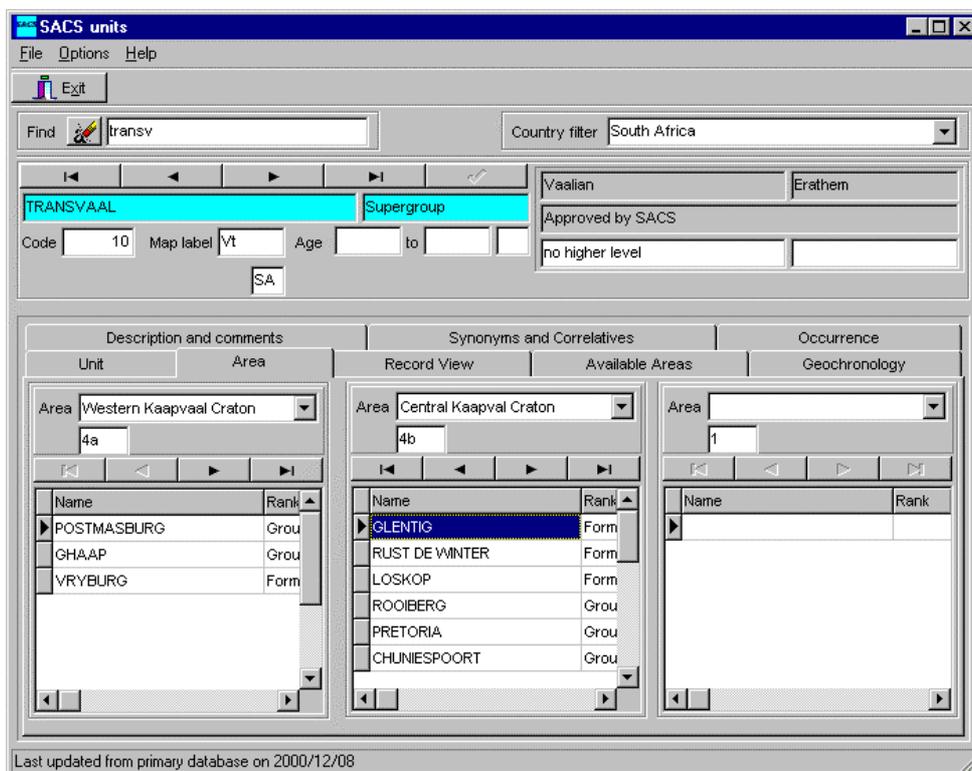
Figure 4. Filtered lists of sub-units for user-selected areas.

Similar views to those presented for the principle unit selected are also available for the sub-units, as illustrated in Figure 5 and Figure 6 for sub-unit description and occurrence, respectively.
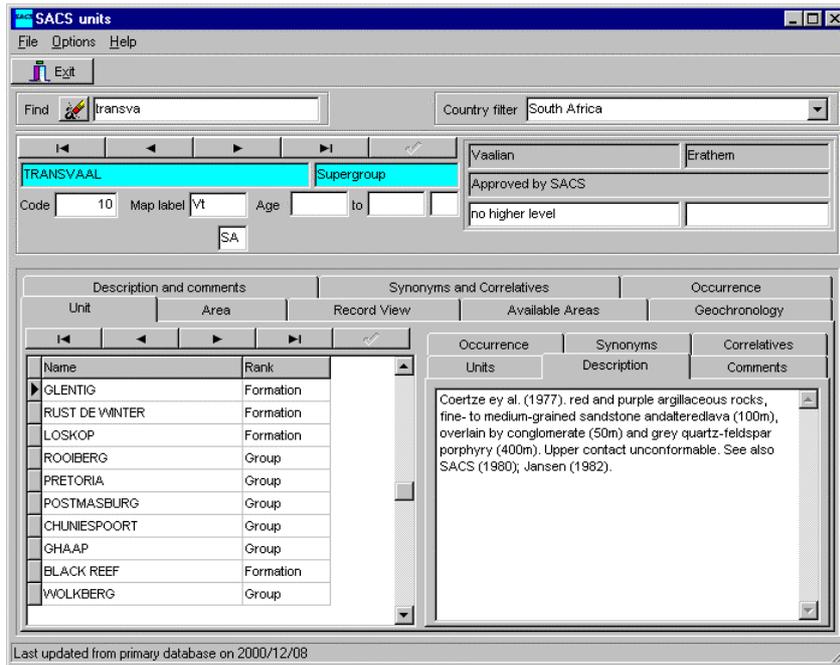
Figure 5. Description of the sub-unit selected, in this case the Glentig Formation.
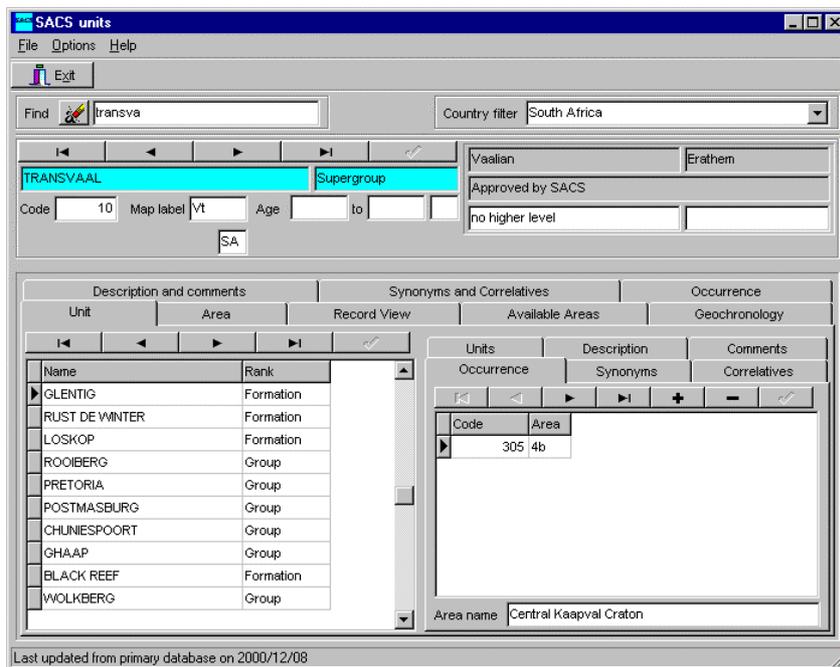
Figure 6. List of geographic areas in which the sub-unit occurs. The grid at the right provides the area codes whilst the box at the bottom right provides the area name. In cases where the sub-unit occurs in more than one area, one may step through the list to see the names of the various areas.

Printed output from the database

It is also possible to print some of the details illustrated in Figure 1 by selecting **File |
Print** from the main menu. A dialog box provides a list of report formats available (Figure 7)
and the user should highlight the appropriate one and click on the **Select** button. Titles are
listed on the left and more detailed descriptions of each report are provided on the right.
Printouts may be reviewed before sending to the printer (Figure 8) and the printer setup may
also be changed before printing (Figure 9). An example of one such printed report is provided
in **Appendix B: Example of printed report for the Transvaal Supergroup.**
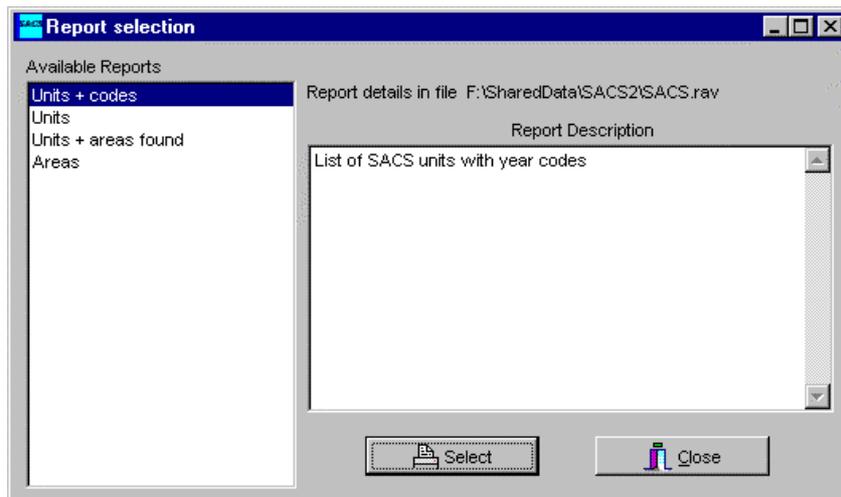
*Figure 7. List of report definitions available for the printing of hierarchical
lists of the stratigraphic units.*

Figure 8. Example preview of one report for the Transvaal Supergroup and its descendent units.

Figure 9. Report setup options.

Links to attribute data in other databases

Geochronological information

The basic structure of this database may be augmented by additional attribute data. In order to illustrate this concept, the stratigraphic database has been linked to the DateView

geochronology database (Eglington, 1999; Eglington, 2000; Eglington and Harmer, 2000) (Figure 10). Any form of attribute data from separate databases may be implemented and displayed on individual tabsheets, such as the one labelled **Geochronology** in Figure 10, provided that these databases include information indexed on the unique unit code used by the Council for Geoscience.
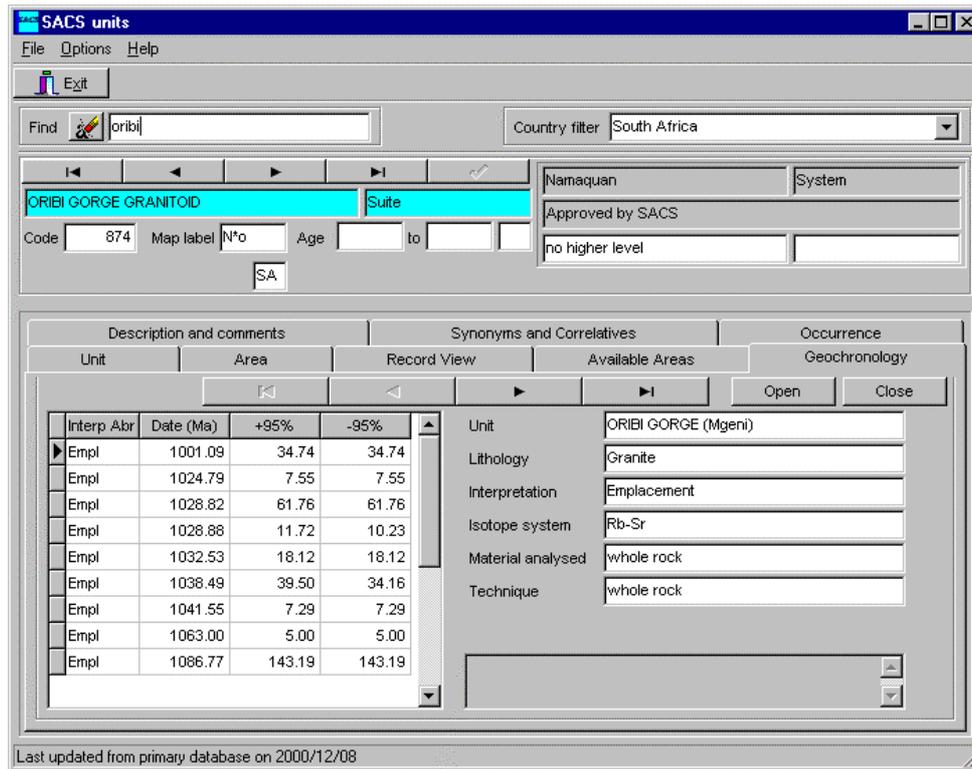
Figure 10. Example of linked attribute data for the principle unit selected, in this case geochronological data from the DateView database compilation. Displayed dates are limited to those identified as reflecting emplacement, extrusion or deposition.

Use of this software to test enhancements to GEODE

In many cases it is easier to test the impact of changes to database design and structure in the desktop environment before implementation in a client/server environment. This software has been modified for these purposes, as documented below.

One of the limitations of the current structure of the database is that the hierarchical succession of lithologies can not be easily presented. Whilst it is recognised that no single view of the contents of a database can ever be correct in all respects, it was felt that the

default view presented to users ought to more correctly reflect stratigraphic succession than the arbitrary sequence of units sorted by their unique SACS codes. To this end, an additional field was introduced to contain a code which would allow one to sort units by measured or inferred age. Figure 11 illustrates a view of the database in which this field (named Years) has been made visible to the user. Individual values for the field may be modified in an easy, user-friendly manner so as to test the system and accumulate data which may be imported to the master GEODE database once testing is complete.

Additional modifications to the design of the database will also be tested so as to facilitate future preparation of geochronological development maps and the semi-automated development of map legends.

The button labelled Modify date updated has been provided so that an iterative process may be followed without the need to overwrite information which has already been migrated to GEODE.
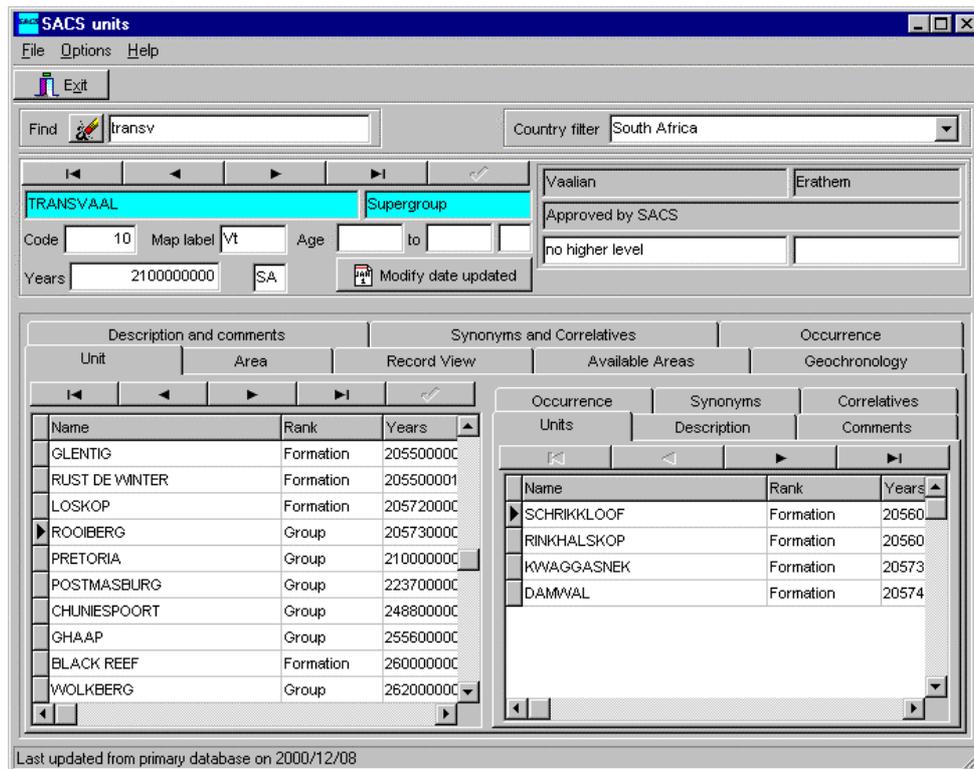
Figure 11. Default view of the stratigraphic database showing additional fields and controls which have been provided to test the sequencing of data records so as to more correctly reflect the succession of individual units in the heirarchy

A convention has been adopted, when entering data in the Year field, in which the date (given in years) contains the digit 9 in the right-most position if the age is inferred or interpolated. Units whose sequence position (age) is based on precise geochronological information should not have the digit 9 in this position.

Acknowledgements

References

Eglington,B.M. (1999). DateView: a 32-bit Windows geochronology database. *Council for Geoscience Open File Report,* **1999-0207-O**, 1-12.

Eglington,B.M. (2000). DateView desktop geochronology database. *J. Afr. Earth Sci.,* **31**, 20-21.

Eglington,B.M. (2001). Software to extract information on SACS units from GEODE: Version 1.1. *Council for Geoscience Open File Report,* **2001-0026-O**, 1-4.

Eglington,B.M. and Harmer,R.E. (2000) DateView geochronology database*, Geocongress 1999*

Eglington,B.M., Tucker,S., Wolmarans,L.G. and Johnson,M.R. (2001). Desktop database compilation of SACS unit information: Version 2.0. *Council for Geoscience Open File Report,* **2001-0027-O**, 1-21.

Joubert,P. and Johnson,M.R. (1998) *Abridged lexicon of South African stratigraphy*. Council for Geoscience, Pretoria, 160 pp.

Appendix A: Configuring the Borland Database Engine (BDE)

All data tables comprising this database are Paradox[TM] and require (in this implementation) the Borland Database Engine (BDE). Configuration of the BDE is achieved by running the application BDEADMIN.EXE, installed with the software. This appendix documents the settings which should be in effect once the software has been installed.
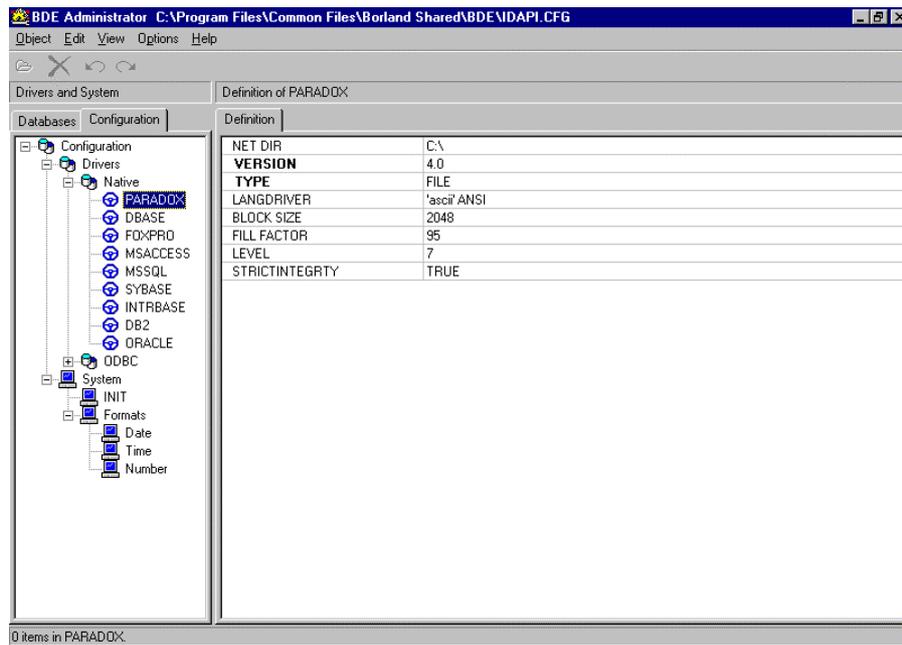
Figure 12. BDE definitions for Paradox[TM] databases. The only definition which the user may need to change on this page is that for the NET DIR (net directory).

Figure 12 illustrates the default configuration of the Paradox driver in the BDE. In general the user should not need to change anything on this page. In situations where a number of users share a database across a LAN, all users should have the NET DIR set to the same, shared folder on the computer acting as server. The BDE controls record access via files located in this directory.

Figure 13 shows the default initial configuration of the BDE. No changes should be made to these settings.
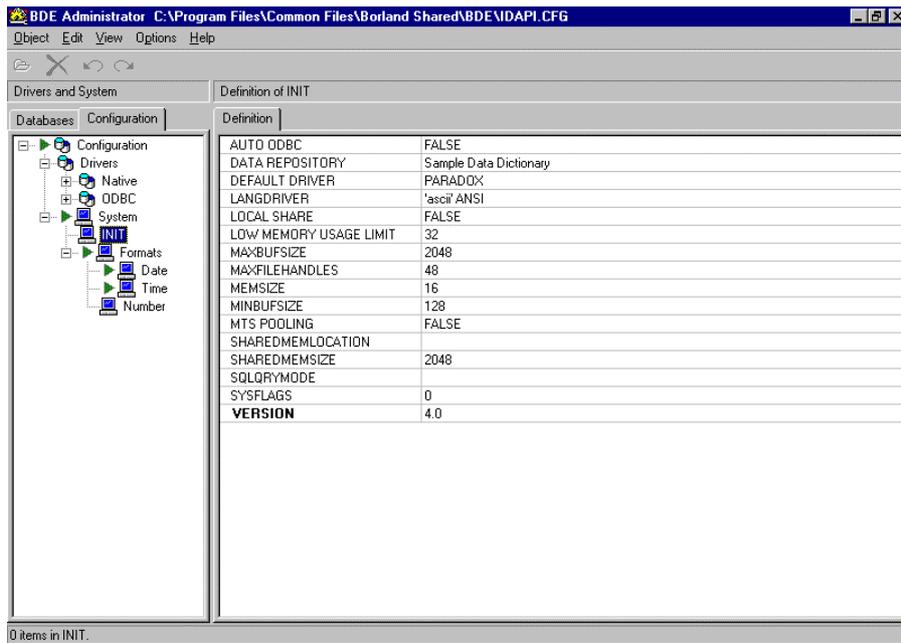
Figure 13. BDE definitions for the initial system configuration. Users should not need to change any fields on this page.
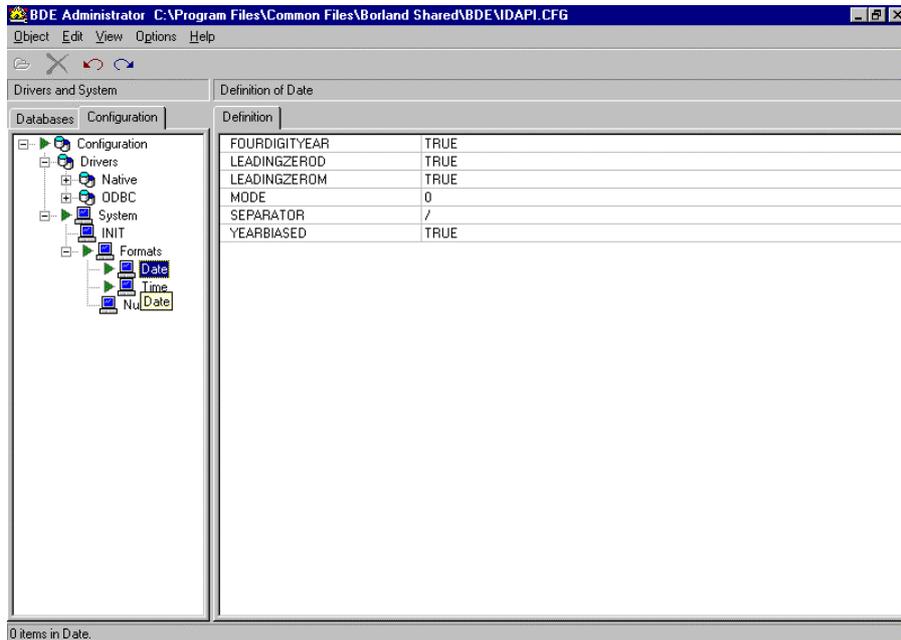
Figure 14. BDE definitions for date formatting. All fields should be set to those shown above so as to ensure that all date information in the database tables is Year 2000 compliant.

It is important to ensure that the date formats used within the database are Year 2000 compliant. To ensure this, the BDE settings should be as illustrated in Figure 14.

Figure 15 shows the default settings for numeric data. Both this page and that for time should not require changes.
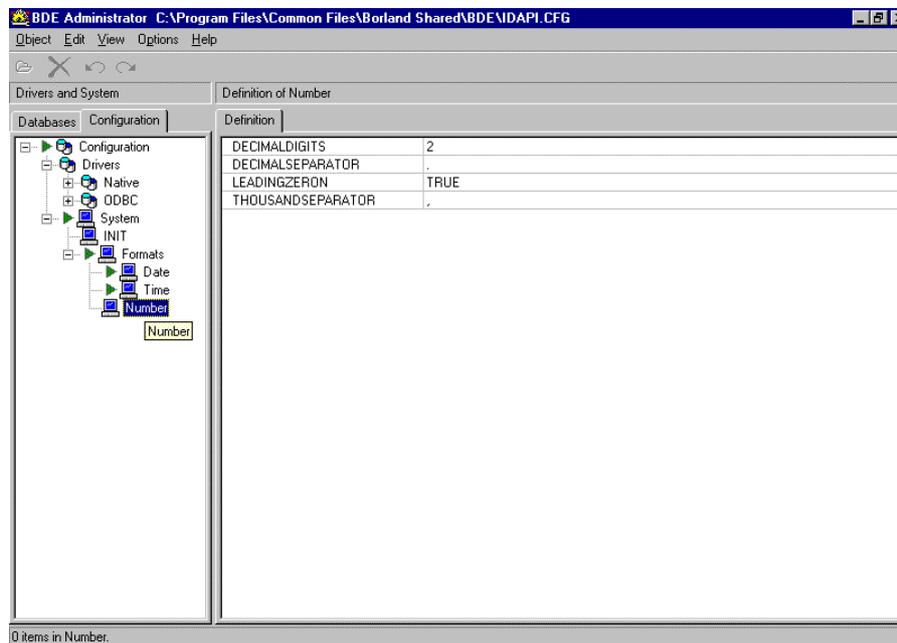
Figure 15. BDE definitions for the default format of numeric data. Users will not normally need to change any of this information.
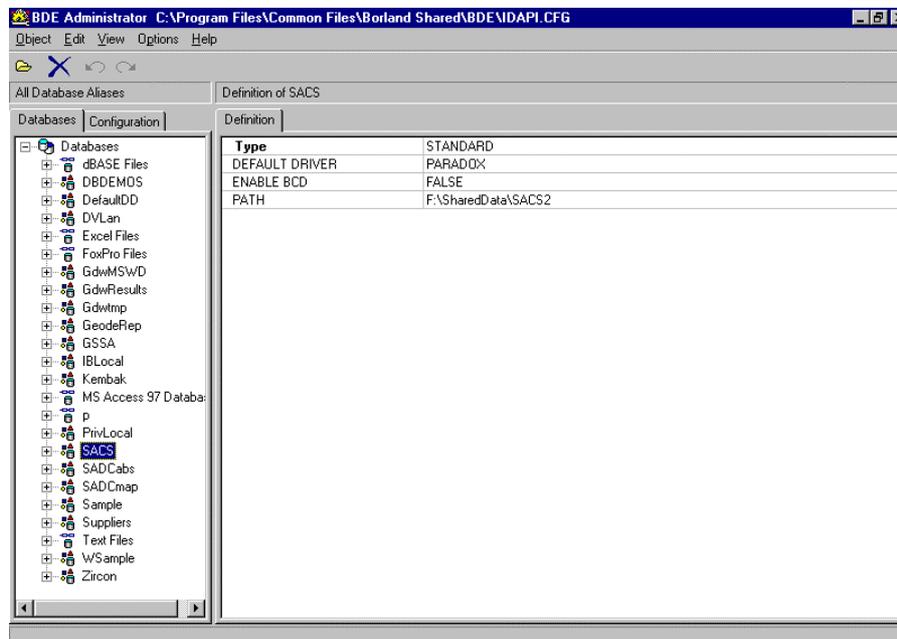
Figure 16. Association of an alias (in this case SACS, highlighted on the left and its associated driver and path settings. The path should point to the folder in which the data tables reside. Default installations would have this as C:\SACS

Finally, if one decides to change the name or location of the folder in which the Paradox^{TM} tables are stored subsequent to software installation, the path associated with the alias used by the software should be modified, as illustrated in Figure 16.

Appendix B: Example of printed report for the Transvaal Supergroup